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Next Steps:



Atchafalaya River Delta.

Getting Results

Actions to Accelerate the Reduction of Nitrogen and Phosphorus

To reduce the size and impacts of the hypoxic zone and improve water quality in the Mississippi/Atchafalaya River Basin, landowners and resource managers must reduce nitrogen and phosphorus in the surface waters of the Mississippi/Atchafalaya River Basin. Although many other natural and seasonal factors contribute to the formation of the hypoxic zone, reducing nutrient loadings from the various sources in the Basin addresses the most critical and controllable cause of hypoxia. No single action or strategy will achieve the necessary reductions. The optimal approach will take advantage of the full range and variety of actions to reduce nutrient loss to

waters and increase nutrient retention and removal.

The work of the Task Force will continue to provide a basin-wide context for the continued pursuit of both voluntary, incentive-based efforts for nonpoint sources and existing regulatory controls for point sources. Improved coordination and, in most cases, continued expansion of the outstanding private and government supported efforts to reduce losses of nutrients are central to the success of this strategy. Throughout the Mississippi/Atchafalaya River Basin much work is underway to increase the efficiency of farming

practices, reduce point and nonpoint sources of pollution, and restore wetlands and riparian buffers. Landowners and managers primarily are taking these actions to achieve local water quality goals or implement conservation practices and management practices.

Even though current activities of landowners and managers will contribute to reducing the size of the hypoxic zone and improving basin water quality, they are not sufficient to meet the goals of this plan. Current funding for the necessary actions is insufficient. In addition, emerging issues, such as biofuels, climate change, changes in agricultural practices, and new technologies for monitoring and modeling will have significant effects on the design and implementation of this plan. The Task Force has identified the actions listed below to encourage and advance the continued implementation of cost-effective, voluntary, incentive-based best management practices and conservation practices at the local and regional level—actions to both

reduce loss of nutrients into the water and to reduce those loads once they exist. These actions are intended to support and add greater specificity to the actions begun under the *2001 Action Plan*.

Following each action are the reasons for the action, the key players, and the process for implementing the action. Because many of these actions are beyond the scope of existing state and federal water quality and conservation efforts, they will achieve only limited progress without additional financial (and in some cases legislative) support. Therefore, the plan also includes a description of the “critical needs”—additional funding and analyses that are essential to achieve significant reductions in the size of the hypoxic zone. The Task Force is committed to meeting these critical needs, wherever possible, and is publishing a separate, more detailed Operating Plan to guide the implementation of these actions.

Phosphorus Reduction

Phosphorus is the nutrient primarily responsible for the eutrophication of Minnesota's surface waters. An overabundance of phosphorus results in excessive algal production in Minnesota waters. In response to a dissolved oxygen TMDL on the Lower Minnesota River, Minnesota developed the *Statewide Phosphorus Report* which quantifies the phosphorus loading to Minnesota waters from various point and nonpoint sources. In 2005, Minnesota developed a Phosphorus General Permit for forty point sources in the Minnesota River Basin. Under the permit, the point sources have the option of trading to meet their water quality-based effluent limits.

The Metropolitan Council owns and operates eight municipal wastewater treatment plants in the Twin Cities metropolitan area of St. Paul and Minneapolis. Since 1990, the Council has achieved dramatic reduction in phosphorus discharged from its plants to area receiving waters. Since the peak of phosphorus discharge in 1995, the Council has achieved a 78% reduction in phosphorus loads.

To understand the magnitude of such a reduction, it would be as if we went back to before 1900. At that time, the metropolitan area had a population of 500,000 people and it is estimated that 1,860 lbs/day of phosphorus was discharged to area rivers. Today, 2 million more people live in this area, yet discharge only 1,670 lbs/day.



Farmers use a line-transect method of determining the percentage of ground covered by crop residues for soil protection.

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Complete and implement comprehensive nitrogen and phosphorus reduction strategies for states within the Mississippi/Atchafalaya River Basin encompassing watersheds with significant contributions of nitrogen and phosphorus to the surface waters of the Mississippi/Atchafalaya River Basin, and ultimately to the Gulf of Mexico.

WHY DO THIS?

Because the soils, hydrology, land use, and cropping practices as well as the legal, legislative, and administrative framework vary considerably across the 31 states in the Basin, the Task Force recognizes that no single approach to nutrient reduction would be effective in every state. All states already have programs to reduce nutrient losses from both point and nonpoint sources. However, while most states have plans within those programs to reduce their water quality problems, those plans are often focused on local or regional water quality. Existing plans may need to be modified to incorporate nitrogen and phosphorus reduction activities within the state to reduce loadings to the Gulf, while continuing to protect and restore local water quality. These strategies will provide a road map for each state, a more detailed basis for budget development and implementation, and a vehicle for coordination with other states in the Basin. Once the state strategies are developed and adopted by the broad reach of stakeholders throughout each state, and new funding

is provided, Federal and State agencies and many involved stakeholders can accelerate their efforts to reduce nutrient impacts on local waters and the Gulf.

WHO WILL TAKE THE LEAD?

Mississippi/Atchafalaya River Basin States, Federal agencies

WHO ELSE WILL HELP?

Sub-basin Committees, local stakeholder groups, and other regional groups

HOW DO WE DO THIS?

State nutrient reduction strategies should be completed as soon as possible but no later than 2013. Strategies should target those watersheds with significant contributions of nitrogen and phosphorus to the surface waters of the Mississippi/Atchafalaya River Basin and ultimately to the Gulf of Mexico. Ongoing nutrient

pollution control efforts should continue, while states, in collaboration with other states in the Basin and Federal agencies, complete the strategies and seek necessary funding. Implementation of the state strategies should be started as soon as practicable, but no later than 2013. The development of state nutrient reduction strategies as prescribed by this plan is to be complementary to, and shall in no way delay or interfere with the progress of any existing or planned nutrient reduction activities, or identification of priority watersheds. To further advance progress, the States should provide a list of activities for incorporation into the Annual Operating Plans, identifying planned nutrient reduction activities and the corresponding availability and needs for funding.

Implementation of the Action Plan will require a significant level of commitment from the Federal agencies and State and local governments, and increased awareness and action by the many varied stakeholders. Existing relationships with key stakeholders should be maintained and additional relationships developed with other stakeholders to develop and implement strategies to reduce nutrient loads to the Gulf of Mexico and to water bodies within the Basin. The States are uniquely

qualified to identify the key stakeholders within their states who can influence opinion and support needed changes in practices and programs. State agencies have established relationships with their constituents, whether agricultural producers or regulated entities such as wastewater facilities. This approach will allow Federal and State agencies and stakeholders in each state to focus on activities that will be most effective in their area.

WHAT ARE THE CRITICAL NEEDS?

Federal agencies, working with the States and the Sub-Basin Committees, will need to establish incentives through the 319 program, Farm Bill programs, or other federal funding sources to provide additional resources for the development and implementation of state-level nutrient reduction strategies.

The States and Federal agencies must coordinate efforts across organizations and programs and use adaptive management to modify the strategies as new information and innovative solutions are acquired to identify critical watersheds, assess current conditions, and maximize potential nitrogen and phosphorus reductions with the most cost-effective approaches.

On-Farm Assistance

Since 2005, over \$1 million has been provided to landowners in Arkansas for installation of on-farm structures to reduce sediment and nutrient runoff. These projects have been implemented in the Arkansas River and Bayou Bartholomew/Beouf-Tensas basins. Overwhelming public participation and interest has created additional opportunities for implementation of nutrient reduction programs in other Mississippi River tributary watersheds.



Complete and implement comprehensive nitrogen and phosphorus reduction strategies for appropriate basin-wide programs and projects. Target first those programs and projects with significant federal lead or co-implementation responsibilities.

WHY DO THIS?

Federal agencies have significant programs and projects that affect water quality in the Gulf and locally throughout the Basin. In some cases a Federal agency may have direct lead for a specific activity, such as management of water flow and navigation on large, interstate rivers or management of fisheries. In other cases federal programs help to set the parameters of programs that are co-implemented or delegated to states, such as technology standards for wastewater treatment or criteria used as the basis for water quality standards. Broader federal strategies are also needed to establish a context and approach to guide and coordinate the actions of these other partners. These strategies could include programs to identify effective nutrient reduction approaches, including streamlining regulatory requirements, utilizing innovative funding mechanisms, and implementing best management practices. For example, a federal strategy for restoration of the Mississippi/Atchafalaya River Basin's natural assimilative system would facilitate and help

coordinate federal and state actions to implement the plan. These federal, basin-level strategies will help set a framework for individual state action and support collaborative efforts for program planning and implementation.

WHO WILL TAKE THE LEAD?

Federal agencies, Mississippi/Atchafalaya River Basin States

WHO ELSE WILL HELP?

Sub-basin Committees, other regional groups

HOW DO WE DO THIS?

Federal strategies for programs and projects with the greatest impact on nutrient levels within the Basin should be identified by June 2008 and completed by 2009. As part of the strategy, Federal agencies will identify opportunities to align existing programs with hypoxia efforts. For example, the USACE should

look for opportunities to reduce nutrient loadings related to Corps projects and programs, ensure that environmental and related documents specifically address the hypoxia impact, and take advantage of environmental projects to create wetlands and reconnect backwater and riparian zone areas to absorb nutrients. Efforts should be made to better engage the research and development expertise in the Corps with regard to reducing nutrient loadings related to Corps civil works projects. Another example is for EPA to provide direct financial and technical support to its state partners in the Mississippi/Atchafalaya River Basin as they develop a scientific basis to assist in the adoption of state numeric nutrient standards. These cooperative efforts not only will serve to assist the states in protecting in-state water quality, but also may result in reduced nutrient loadings to the Gulf. More detail on each agency's effort is documented in the Annual Operating Plan.

WHAT ARE THE CRITICAL NEEDS?

The opportunity may exist through the implementation of the 2007 Farm Bill for additional conservation technical assistance, including rapid watershed assessments to help prioritize use of limited financial assistance

for producers, establishing a Regional Water Enhancement Program to provide funding to support development and implementation of water quality plans at the watershed scale, providing funding to support conservation innovation addressing nutrient reductions, and additional funding for working lands (Environmental Quality Incentive Program) and wetland restoration, creation, and enhancement (Conservation Reserve Program/Wetlands Reserve Program/Conservation Technical Assistance).

Ongoing analysis of the impacts of emerging issues on water quality, such as the increased production of biofuels, will also be critical to ensure that the nitrogen and phosphorus strategies will continue to improve water quality in the Mississippi/Atchafalaya River Basin and ultimately the Gulf of Mexico.

Additionally, an interagency coordination strategy to leverage USDA, EPA, USACE, and other funding mechanisms to eliminate financial barriers for private landowners implementing conservation practices to address nutrient runoff from neighboring properties will aid in the implementation of these federal strategies.



Managing sediment sustains economic activity and can contribute to ecosystem restoration and protection.



While developing comprehensive state and federal nitrogen and phosphorus reduction strategies and continuing current reduction efforts, examine and, where possible, implement opportunities to enhance protection of the Gulf and local water quality through existing federal and state water quality, water management, and conservation programs.

WHY DO THIS?

For programs whose primary intent is not to mitigate hypoxia, such as wildlife habitat enhancement, conservation practices, navigation controls, or wastewater discharge permits, incorporating considerations of additional benefits into implementation decisions can result in the “win-win” outcome of adding increased nutrient retention and capture benefits to these programs, and consequently improving water quality downstream and in the Gulf.

The guiding principle of this plan is that when establishing priorities for watershed restoration, States, Tribes, and Federal agencies within the Mississippi/Atchafalaya River Basin will consider the potential for benefits to the Gulf of Mexico. This principle is especially important in the context of changes in agricultural markets such as the increased demand for corn for ethanol production that could have a substantial effect on nutrients delivered to the Gulf. Many federal, state, and tribal

programs offer the opportunity to enhance nutrient reductions, whether large water infrastructure projects or day-to-day decisions on zoning, permitting, and land use planning. However, most state, tribal, and federal projects usually only address local water quality concerns. Support for approaches that protect local water quality, including drinking water sources, can be leveraged to increase support for mitigating Gulf hypoxia. There is frequently strong public support for protecting drinking water sources. Public awareness and support for local water quality benefits can increase support for actions that ultimately reduce Gulf hypoxia. These entities should consider this guiding principle, ensuring that these projects, including land and river management strategies, and flood control and navigation projects throughout the Basin, examine their effect on Gulf hypoxia as well as look for opportunities to increase the ability to reduce nutrients which harm local waters, including drinking water sources, and the Gulf, through design and operation changes.

WHO WILL TAKE THE LEAD?

USACE, U.S. Department of the Interior (DOI), EPA, USDA, Mississippi/Atchafalaya River Basin States

WHO ELSE WILL HELP?

Sub-basin Committees

HOW DO WE DO THIS?

Each Federal agency and State will identify opportunities for implementing cost-effective nutrient reduction through existing programs. Two examples of how to do this are given below, although there are many other programs at each participating Federal agency that will need to be included.

One example of this is the manner in which USDA plans to address concerns about the effect that increased biofuels production will have on nutrient loads to the Gulf. Management of agricultural lands in the Mississippi River Basin is not static, but invariably changes in response to changes in the demand for agricultural commodities. USDA provides technical and financial assistance to farmers and ranchers to help them address environmental concerns associated with agriculture production. The technical foundation for this assistance

is the development and application of conservation practice standards through several conservation programs that address a wide variety of environmental issues in addition to water quality. These programs are designed to help maintain the sustainability of agricultural lands regardless of their use. Given the need for further reductions in nutrient loads to the Gulf, in the delivery of its programs within the Mississippi Basin, USDA will place additional emphasis on conservation practices with high potential for reducing nutrient loadings. These conservation practices include nutrient management, cover crops, the siting of wetlands, and on-farm drainage water management. This approach permits agriculture production to adjust to meet the changing needs of the market while maintaining the sustainability of the resource base and minimizing environmental effects.

USDA will encourage the increased use of its nutrient management standard to minimize nutrient loss from fields to help alleviate the impact of increased biofuels production on nutrient loads to the Gulf. The nutrient management standard requires farmers to account for all plant-available nutrient sources immediately available or rendered available throughout the crop production cycle



When heavy rains occur, unprotected farm fields can yield topsoil, as well as farm fertilizers and other potential pollutants.

and to apply only the amount of nutrients needed to maintain nutrient balances. Nutrient applications needed to maintain nutrient balances are based on realistic yield expectations and attempt to maximize profitable production. The use of cellulosic feedstocks, such as crop residues, perennial grasses, and trees for biofuels production will require utilization of different conservation systems and conservation practice standards, such as the one for residue management. USDA will continue to adjust current standards and develop additional standards, where needed, to permit cellulosic feedstocks to be produced and utilized in a sustainable manner.

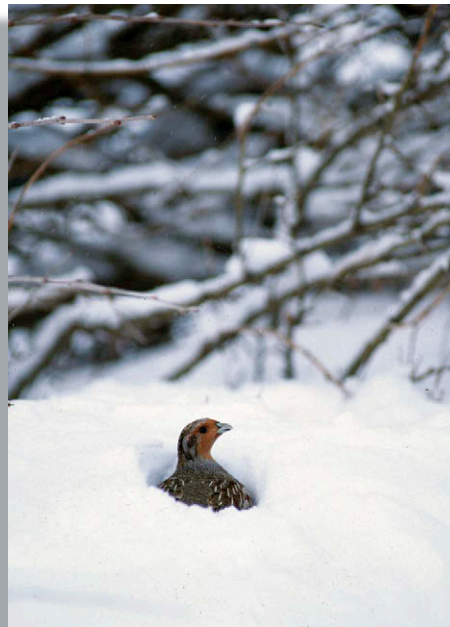
Another example is the massive coastal protection/restoration program being undertaken by the State of Louisiana, the federal government, and various stakeholder groups. The most critical element of this program involves retaining river sediment and river-borne nutrients within the coastal marshes to the greatest degree possible by redistributing river water throughout the delta before it reaches the Gulf of Mexico. Diverting river water into the deltaic system on a large scale could provide an important sink for some of the excess nutrients that

cause hypoxia through plant uptake, bacterial processing, and sedimentation. In addition, increasing the number of outlets for river water could significantly increase mixing in the coastal ocean and reduce salinity stratification and the setup conditions for hypoxia. There is substantial evidence that such a program would save wetlands now in jeopardy and increase productivity and sequestration of both nutrients and carbon.

While this apparent “win-win” strategy is complex and expensive, authorization and funding for Louisiana’s critical river diversion program has garnered broad public support. There are, however, serious environmental concerns about releasing huge volumes of nutrient-rich river water into the estuarine zone instead of into the nearshore ocean where it goes today. Thus, river diversions could be postponed until nutrient levels are significantly reduced upstream, although such postponement could undermine the restoration of what has come to be known as “America’s Wetland.”

WHAT ARE THE CRITICAL NEEDS?

- Identify barriers to aligning existing programs, projects, and initiatives with needs of hypoxia.
- Continue funding as defined by current budget requests for actions identified in the Annual Operating Plan.



A riparian buffer provides shelter and other habitat for wildlife along Bear Creek in central Iowa.